REVIEW | OPEN ACCESS

Medical Science

Concomitant psoriasis with lichen planus in single patient: A systematic review

Sultan Aqeel Jaafari[1*], **Mohammed Ibrahim Alsaeed**[2], **Ali Ahmed Al-Abdullah**[3], **Hussein Adel Al-Sakkak**[4]

To Cite:
Jaafari SA, Alsaeed MI, Al-Abdullah AA, Al-Sakkak HA. Concomitant psoriasis with lichen planus in single patient: A systematic review. *Medical Science* 2024; 28: e161ms3493
doi: https://doi.org/10.54905/disssi.v28i154.e161ms3493

Authors' Affiliation:
[1]Consultant Dermatology, King Fahad Central Hospital, Jazan, Saudi Arabia
[2]MBBS, King Abdulaziz Hospital, Eastern province, Al-Ahsa, Saudi Arabia
[3]Dermatology senior registrar, Al-Ahsa Health Cluster, Saudi Arabia
[4]MBBS, Al-Ahsa, Eastern Province, Saudi Arabia

[*]**Corresponding Author**
Consultant Dermatology, King Fahad Central Hospital, Jazan, Saudi Arabia
Email: sls3003@hotmail.com

Contact List

Sultan Aqeel Jaafari	sls3003@hotmail.com
Mohammed Ibrahim Alsaeed	Mohammed.saeed20136@gmail.com
Ali Ahmed Al-Abdullah	alialabdullah1993@gmail.com
Hussein Adel Al-Sakkak	hsad88@hotmail.com

ORCID List

Sultan Aqeel Jaafari	0009-0001-9886-3730
Mohammed Ibrahim Alsaeed	0000-0001-6541-0121
Ali Ahmed Al-Abdullah	0009-0002-3029-7290
Hussein Adel Al-Sakkak	0009-0004-4339-3577

Peer-Review History
Received: 09 December 2024
Reviewed & Revised: 11/December/2024 to 18/December/2024
Accepted: 25 December 2024
Published: 30 December 2024

Peer-review Method
External peer-review was done through double-blind method.

Medical Science
pISSN 2321–7359; eISSN 2321–7367

DISCOVERY SCIENTIFIC SOCIETY

ABSTRACT

Background: Lichen planus and psoriasis are separate chronic inflammatory dermatoses with different clinical and pathological characteristics. The reports of coexisting of this two conditions is rare in the literature as mostly as case studies. The overlap of lichen planus and psoriasis is due to shared immunologic mechanisms. The current study aimed to review the available literature of case studies reporting the coexisting of lichen planus and psoriasis to analyze the demographics, clinical features, histopathology, immunological findings, and management outcomes. *Methodology:* This is a systematic review of published cases aimed to assess demographics, clinical appearances, findings from histopathological examinations, immune characteristics, and treatment approaches. Synthesis and data analysis aimed to identify patterns and outcomes common to each case. *Results:* The results of this systematic review showed a wide range of ages of patients with coexisting of lichen planus and psoriasis including pediatric and adult population. The clinical features involved hyperpigmented plaques, papules, mucosal involvement, nail dystrophy, and psoriatic lesions, usually triggered by extrinsic factors such as the Koebner phenomenon. Histopathology, thus confirming the diagnosis, showed combined features of both diseases: Hyperkeratosis, parakeratosis, and band-like lymphocytic infiltrates. Immunologically, both inflammatory pathways involve T cells and cytokines, including TNF-α and IFN-γ. *Conclusion:* The overlap of lichen planus and psoriasis is rarely seen but is clinically essential and requires multidisciplinary approaches. The coexistence of these two conditions would draw upon immunopathological mechanisms, which afford them insights into possible therapeutic targets. Individualized systemically and topically-focused treatments appear to be effective in this overlap syndrome.

Keywords: Psoriasis, Lichen planus, Dermatitis, Coexistance, Histopathology

1. INTRODUCTION

Psoriasis and lichen planus (LP) are two chronic inflammatory skin condition; however, they are rarely coexisting in the same patients (Weston and Payette, 2015). Symptoms of psoriasis included by red, scaly plaques caused by hyper-proliferation of keratinocytes due to an immune-mediated skin disease (Man et al., 2023; McCormick et al., 2016; Nguyen, 2022; Rendon and Schäkel, 2019). Clinical features vary, contributing to various types, including chronic plaque psoriasis, guttate psoriasis, and palmoplantar psoriasis (Koca et al., 2016; Yan et al., 2021). Psoriasis affects approximately 2-3% of the world population with a basis on a very intricate interplay of genetic, environmental, and immunological issues (Ortiz-Lopez et al., 2022; Xiao et al., 2023). Cytokines TNF and interleukins (IL-Code) play a key role in the pathogenesis of this condition (Ortiz-Lopez et al., 2022; Xiao et al., 2023).

On the contrary, lichen planus represents the skin and mucosal surfaces, with some consideration on involvement of hair and nails. Approximately 1% prevalence of LP has been noted (Boch et al., 2021; Manchanda et al., 2024). LP brings to the fore a variety of clinical forms but shares histopathological features as hallmarks (Boch et al., 2021). Etiology remains predominantly idiopathic. However, some studies reported associations of LP with external factors including HCV infection, stress, and certain medications (Georgescu et al., 2018). In addition, genetic predisposition, immune dysregulation of cytokines as IFNα and TNFα, also contribute to its development (Vičić et al., 2023).

These pathological processes differ significantly; however, Immunological mechanisms implicated in their pathology still find common points of convergence. T-cell-mediated immunological response has been involved in both conditions (Aghamajidi et al., 2021). Thus, it may indicate a possible intersection in their unraveling. The two conditions may have close similarities in development of new lesions in the susceptible skin because of Koebner phenomenon (Ji and Liu, 2019). Further, different studies have addressed the converging cytokine profiles in these diseases, and mainly reported elevated levels of IFN-γ (Wang et al., 2022). While the coexistence of psoriasis and LP is rare, this relationship has had a few descriptions in the literature.

For instance, a survey conducted in 711 cases of LP reports that 12 had concomitant psoriasis, and there are descriptions of linear LP and psoriasis occurring together (Naldi et al., 1990). Microscopic examination of skin samples from these patients revealed interesting differences, with predominant CD8+ T lymphocytes in LP lesions, in contrast to predominantly CD4+ T lymphocytes in psoriatic lesions, pointing to subtle differences in their immune profiles but suggesting common antigenic triggers (Ohshima et al., 2011). This systematic review aims to investigate the coexisting presentation of psoriasis and lichen planus regarding of their shared immunopathological mechanisms, possible triggers, and clinical implications.

2. METHODOLOGY

This systematic review analyzes and synthesizes the literature on the concurrent presentation of psoriasis and lichen planus (LP) in a single patient. The study was conducted in the period between June and November 2024. The study method followed the guidelines set forth by PRISMA to ensure a comprehensive and transparent approach.

Search Strategy

The study depended on a systematic survey through various electronic databases, such as PubMed, Scopus, Web of Science, and Google Scholar. The search system involved terms such as combinations of keywords and Medical Subject Headings (MeSH), namely, "psoriasis", "lichen planus", "concomitant skin conditions", "Koebner phenomenon", and "immunological overlap" with Boolean operators (AND, OR). There were no restrictions on language or publication date; hence, all relevant articles were included. Further, the authors conducted a manual search of the reference lists of the pertinent published studies to find more relevant studies.

Inclusion and Exclusion Criteria

Inclusion criteria included studies reporting cases of patients diagnosed with both psoriasis and LP, discussed shared immunological/pathological mechanisms, or provided insights into the Koebner phenomenon in such conditions. The authors included both observational studies (e.g., case reports, case series, cross-sectional studies) and experimental studies. Exclusion criteria were studies that focused only on one condition without co-occurrence mentioned, review articles without primary data, and papers with ineffectual clinical details.

Study Selection

The first search results were imported into deduplication software. Two reviewers independently reviewed the studies' titles and abstracts for possible inclusion. The full texts of those studies that met the inclusion criteria on review of abstracts were then assessed against the inclusion and exclusion criteria. Any dispute between the reviewers was settled by discussion with a third reviewer.

Data Extraction

A standard data extraction sheet was designed to capture key aspects of related studies. The study capabilities included essential characteristics: Author name, year of publication, country of study, type of study design, patient characteristics, description of clinical aspects, diagnostic methods, immunopathological findings, treatment modalities, and outcomes. The data were also cross-verified by an additional reviewer to ensure accuracy.

Data Synthesis

Due to the heterogeneity of studies in populations studied, diagnostic criteria applied, and outcome measures reported, a narrative synthesis was conducted to summarize the findings. Quantitative synthesis (meta-analysis) was not performed due to limitations in the number of studies and variability in study designs.

3. RESULTS

The current review included 10 studies which were eligible according to inclusion and exclusion criteria (Figure 1). The reviewed cases illustrate a heterogeneous population harboring the dual characteristics of lichen planus and psoriasis, which encompass different age groups and clinical presentations. The age groups ranged from 10 -76 years with similar presentation of both genders. The usual clinical manifestations were hyperpigmented or erythematous plaques, papules, and nail involvement. They presented features mixing LP and psoriasis with Koebner phenomenon and Wickham's striae, based on the body region affected. The length of the symptoms differed significantly in that they ranged from 10 days to over 30 years, indicating chronic in some instances but acute in others (Table 1).

Histopathological analyses across studies pointed to shared and distinct features concerning LP and psoriasis. On similar lines, common features included hyperkeratosis, basal cell layer degeneration, and narrow band-like inflammatory infiltration. Specific traits included orthokeratosis, vacuolar degeneration, colloid bodies, and parakeratosis. The immunological studies suggested that LP and psoriasis could derive from shared pathways involving cytokines such as TNF-α and IFN-γ, perhaps accounting for their coexistence. The T-cell infiltration pattern which involves CD4+ and CD8+ subsets. Subsequently, depended on the condition and type of lesion. The illustrated findings emphasize the mutual involvement of immunological and structural alterations in the pathogenesis underlying the overlapping LP and psoriasis (Table 2).

The type of management instituted for any specific case varied yet was often in the direction of combination treatments involving systemic therapies-acitretin, methotrexate, cyclosporine, and TNF-α inhibitors, together with topical treatments such as corticosteroids and calcineurin inhibitors. Other therapies, including phototherapy and lifestyle modifications regarding diet, were also employed in combination with the therapies as mentioned above. The success of treatment varied: Some cases reported almost complete clearance from lesions, while others had persistent features or only partial responses. While systemic treatments achieved near-complete relief in some cases, localized therapies addressed specific symptoms well, notably in cases with mucosal involvement. Cases with chronic or overlapping LP and psoriasis require long-term management strategies to maintain disease control and minimize flares (Table 3).

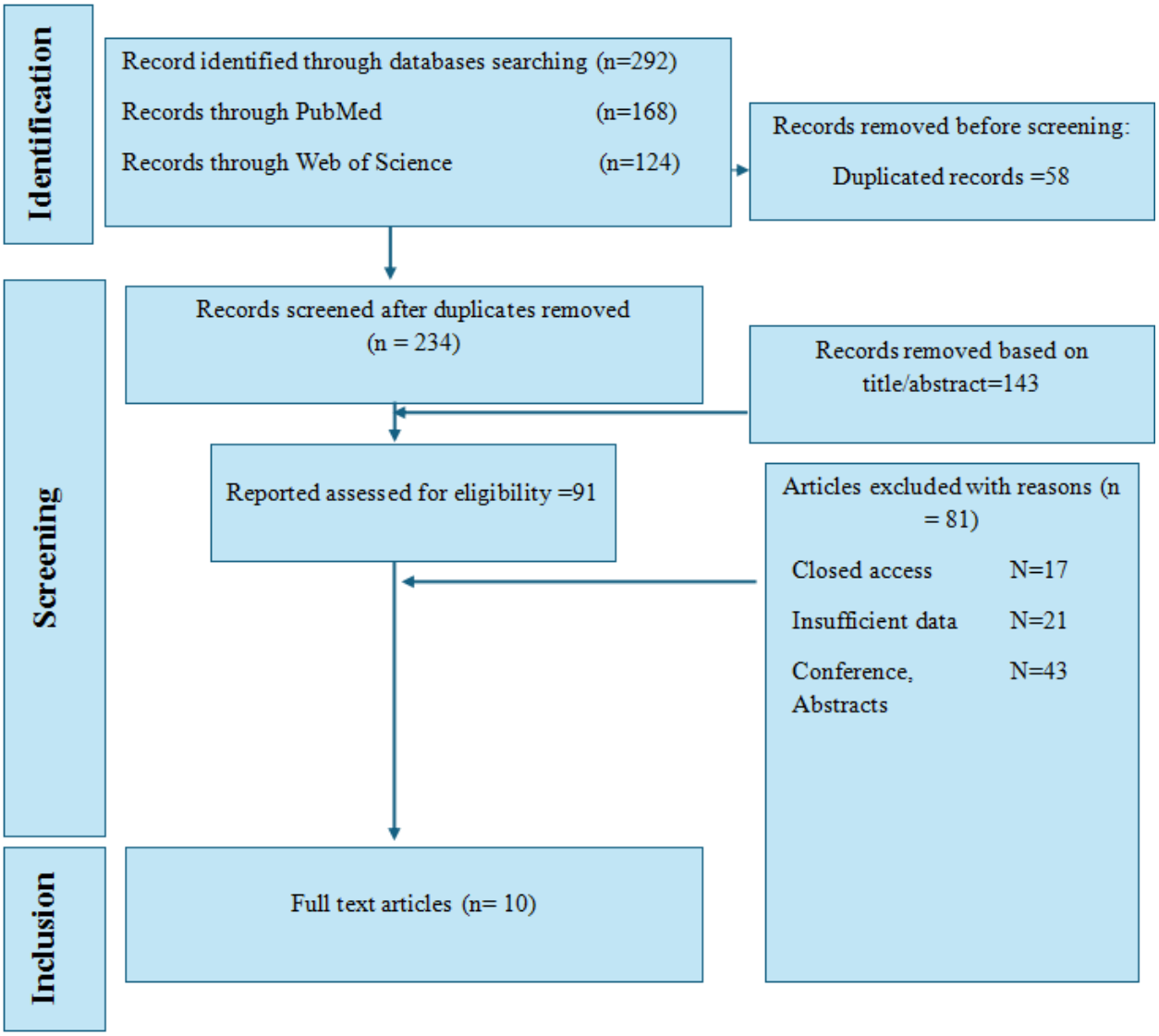

Figure 1 The PRISMA figures showing the steps to choose the studies for systematic review

Table 1 Patient Demographics and Clinical Features

Author/Year	Patient Demographics	Clinical Features	Duration
(Sandhu et al., 2020)	10-year-old male	Hyperpigmented scaly papules and plaques; face, ears, neck, trunk, and extremities; Koebner phenomenon; nonpruritic	Lesions persistent since age 6 months
(Niebel et al., 2020)	52-year-old male	Annular atrophic LP; Psoriatic Arthritis (PsA); asymptomatic plaques on trunk and groin; nail dystrophy	20-year PsA history
(Song et al., 2021)	41-year-old female	Scalp itching, flaking, and hair loss; pink scalp with thick, silvery-yellow scales	20 years of symptoms
(Wechsuruk et al., 2021)	14 patients; mean age: 53.3 ± 13.9	Nail involvement in 92.9% of cases (fingernails and toenails); melanonychia	Median: 42 months (range: 2 months–30

	years; 64.3% female	(85.7%), onychorrhexis (64.3%), nail matrix involvement (100%).	years).
(Shiohara et al., 1989)	21-year-old male; 10 years of psoriasis vulgaris; 3 months of LP	Coexisting psoriasis vulgaris and LP; psoriatic plaques and LP papules on trunk, flexor surfaces, mucosal LP (inner cheeks).	LP: 3 months; psoriasis ongoing for 10 years.
(Gutte, 2016)	26-year-old female; known psoriasis (3 years).	Linear violaceous plaque on the left leg overlapping psoriasis lesions; Wickham's striae, erythematous plaques on the body.	LLP: 1.5 years; psoriasis: 3 years.
(Muneem et al., 2020)	76-year-old Caucasian woman with type 2 diabetes, hyperlipidemia, right iliac artery occlusion, COPD, class 1 obesity	Erythematous papules with scaling on lower extremities, violaceous papules with excoriations	10 days
(Vajaitu et al., 2018)	67-year-old Romanian woman with a history of vitiligo and psoriasis	Scaly erythematous plaques on elbows, hands, and scalp; white striae on oral mucosa resembling leukoplakia	18 years for vitiligo, 2 years for psoriasis
(Delaney and Smith, 1993)	32-year-old Black male from Grenada	Multiple scaly plaques on scalp and face, lichenoid lesions on the lower leg, psoriatic lesions on elbows and knees	5 years for plaques
(Kiluk and Flisiak, 2016)	75-year-old woman with hypertension, essential tremor, and history of oral lichen planus	Itchy erythematous skin lesions in intertriginous areas; oral desquamation	2 years for lesions

Table 2 Histopathology and Immunological Findings

Study	Histopathology	Immunological Findings
(Sandhu et al., 2020)	Orthokeratosis, parakeratosis, vacuolar degeneration, band-like inflammatory infiltrate; neutrophilic abscesses; dermal melanophages; features of both LP and psoriasis observed.	Shared cytokines (e.g., TNF-α, IFN-γ) and Koebner phenomenon implicated in coexistence.
(Niebel et al., 2020)	Sparse lymphocytic infiltrate at the basal membrane, melanophages in lesion center; orthohyperkeratosis, colloid bodies, interface dermatitis in lesion periphery.	T cells and Langerhans cells (LC) accumulation in lesion edges; depletion in atrophic center.
(Song et al., 2021)	Initial biopsy: psoriasiform dermatitis without scarring; follow-up biopsy:	Elevated inflammatory markers: recurrence linked to withdrawal of

	perifollicular fibrosis, lichenoid inflammation, and psoriasiform features.	systemic treatments and immunomodulation.
(Wechsuruk et al., 2021)	Compact orthohyperkeratosis, hypergranulosis, nail matrix involvement, melanonychia, onycholysis.	Not applicable.
(Shiohara et al., 1989)	Psoriasis: elongation of rete ridges, parakeratosis, loss of granular layer; LP: Hypergranulosis, basal vacuolar degeneration.	LP infiltrates: predominance of CD4+T cells; psoriatic infiltrates: both CD4+ and occasional CD8+ cells.
(Gutte, 2016)	LLP: Compact orthohyperkeratosis, focal hypergranulosis, band-like infiltrate, Max-Joseph space, colloid bodies.	Not reported.
(Muneem et al., 2020)	Interface dermatitis with colloid bodies, wedge-shaped hypergranulosis, hyperkeratosis, eosinophils in dermis	Not reported
(Vajaitu et al., 2018)	Hyperkeratosis, irregular acanthosis, Civatte bodies, band-like inflammatory infiltrate of T cells	Not reported
(Delaney and Smith, 1993)	Irregular acanthosis, hyperkeratosis, heavy band-like infiltrate, basal cell layer degeneration, cytoid bodies	Not reported
(Kiluk and Flisiak, 2016)	Epidermal acanthosis, parakeratosis, and mixed neutrophilic infiltrates	Not reported

Table 3 Management and Outcomes

Study	Treatment	Outcome
(Sandhu et al., 2020)	Acitretin 25 mg/day; Narrowband ultraviolet B (NBUVB) phototherapy	Near-total clearance of lesions.
(Niebel et al., 2020)	TNF-α inhibitor (Etanercept 50 mg/week); topical corticosteroids	Significant improvement in both PsA and annular atrophic LP symptoms; systemic corticosteroids discontinued.
(Song et al., 2021)	Cyclosporine, apremilast, methotrexate; nutritional changes (Mediterranean diet, turmeric, curcumin, fish oil).	Reduction in erythema and scaling; disease control with apremilast and methotrexate; flares on dietary changes.
(Wechsuruk et al., 2021)	Topical corticosteroids, vitamin D analogs (78.6%); systemic corticosteroids (64.3%).	66.7% showed minimal to mild improvement; 33.4% moderate to significant improvement; pterygium unresponsive.
(Shiohara et al., 1989)	Topical difluprednate 0.05% ointment.	LP lesions resolved spontaneously in 2

		months, leaving pigmentation; psoriasis lesions worsened.
(Gutte, 2016)	No specific LLP treatment: psoriasis treated with methotrexate in the past.	LLP lesions persisted; histology confirmed an overlap of LLP and psoriasis.
(Muneem et al., 2020)	Betamethasone cream twice daily	Complete resolution in 1 month
(Vajaitu et al., 2018)	Systemic antioxidants, topical steroids for psoriasis, intrabuccal steroids for oral lichen planus	Significant improvement
(Delaney and Smith, 1993)	Topical coal tar, corticosteroids, UVB phototherapy, and PUVA therapy	Significant improvement after 2 months
(Kiluk and Flisiak, 2016)	Prodermin ointment, calcineurin inhibitors	Significant lesion reduction

4. DISCUSSION

The coexistence of lichen planus (LP) and psoriasis means a rare but clinically significant overlap syndrome, demanding major attention for diagnostic and therapeutic challenges (Gorouhi et al., 2014). Both these diseases are chronic inflammatory dermatoses with varying histopathological features; however, they may share overlapping immunological pathways-including but not limited to pro-inflammatory cytokines such as tumor necrosis factor-alpha (TNF-α) and interferon-gamma (IFN-γ) (Gorouhi et al., 2014). It is observed from the available reports that the clinical presentation ranges from hyperpigmented plaques, papules to nail and mucosal involvement. These findings correspond with previous literature stressing that LP and psoriasis can co-habit due to shared environmental triggers and immune mechanisms, even if they differ in pathology (Adamski et al., 2023; Li et al., 2024).

Histopathological examination greatly aids in resolving the overlapping features of LP and psoriasis. The histopathological findings oozing out of LP include features such as hyperkeratosis, vacuolar degeneration, colloid bodies, and band-like infiltrates, whereas parakeratosis, elongation of rete ridges, and neutrophilic microabscesses confine to the findings of psoriatic lesions. The presence of these findings in the same lesions supports the assumption of a shared pathogenic mechanism, such as the Koebner phenomenon, which is believed to aggravate both disease states by trauma (Karampinis et al., 2024). It highlights the dynamic interplay between external triggers and immune responses in overlapping conditions. The immune findings in the research presented show significant involvement of the poised innate and adaptive immune systems in LP and psoriasis overlapping.

The predominance of T-cell infiltrates, including CD4+ and occasionally CD8+ within various lesions, suggests the importance of T lymphocytes in the pathogenesis of the disease states. Langerhans cells accumulate, with cytokine dysregulation in the peripheries of lesions that further support the notion of shared inflammatory quotes (Iijima et al., 2003). This immunology is a premise upon which targeted therapies, especially biologics, help manage such overlap syndromes. Overall, the studies analyzed indicate the importance of personalized treatment strategies. Systemic therapies, such as methotrexate, cyclosporine, and TNF-α inhibitors, have been successfully used in symptomatic management in many cases, mainly when LP and psoriasis were unreceptive to traditional treatments (Niebel et al., 2020; Song et al., 2021).

Localized lesions can be cured by topical corticosteroids and calcineurin inhibitors, and phototherapy may also assist in the control of the disease (Delaney and Smith, 1993). However, such chronic cases are hallmarks of long duration and need to be sustained so that monitoring may prevent incidences of recurrence, as explained by (Wechsuruk et al., 2021). Interestingly, some patients developed a flare-up of symptoms after the withdrawal of systemic treatments or modification of their diets, suggesting a critical role for persistent

treatment regimens and adherence (Song et al., 2021). The differences in response rates across cases may echo distinct disease chronicities, severities, and patient immunological profiles in each case. Therefore, future studies should examine biochemical markers that could predict treatment response and guide personalized treatment options.

The limitation in this study is that data are restricted to case reports and small-sample observational studies, indicating the possibility of selection bias and unlikeliness of generalizing findings. One such challenge in determining standardized conclusions has been heterogeneity among specific parameters, such as patient characteristics, clinical manifestations, and treatment protocols in the reviewed cases. Additionally, most reports lacked long-term follow-up; hence, assessing sustained outcomes and recurrence rates was restricted. Not all studies provided uniform detail concerning the histopathological and immunological findings, which may dent in an understanding of the shared pathophysiology of lichen planus and psoriasis overlap. Further studies on larger patient populations and prospective studies are needed to confirm the above conclusions and facilitate a better understanding of this rare entity.

5. CONCLUSION

In conclusion, LP and psoriasis overlap with a unique clinical entity; a multidisciplinary discussion regarding diagnosis and management is indispensable. This review presents a clear need for more research to identify the significant pathogenetic mechanisms and optimize the treatment approach towards this challenging dermatosis.

Acknowledgement

We sincerely thank all the participants whose cooperation made this research possible. Special thanks go to our colleagues and advisors for their guidance, encouragement, and constructive feedback during the preparation and execution of this study. Finally, we are deeply grateful to our families and friends for their unwavering support and motivation.

Ethical approval

Not applicable.

Informed consent

Not applicable.

Funding

This study has not received any external funding.

Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

REFERENCES

1. Adamski Z, Kanabaj K, Kuźniak A. The link between psoriasis and other diseases based on epidemiological and genetic analyses. Postepy Dermatol Alergol 2023; 40(4):496-503. doi: 10.5114/ada.2023.130518
2. Aghamajidi A, Raoufi E, Parsamanesh G, Jalili A, Salehi-Shadkami M, Mehrali M, Mohsenzadegan M. The attentive focus on T cell-mediated autoimmune pathogenesis of psoriasis, lichen planus and vitiligo. Scand J Immunol 2021; 93(4):e13000. doi: 10.1111/sji.13000
3. Boch K, Langan EA, Kridin K, Zillikens D, Ludwig RJ, Bieber K. Lichen Planus. Front Med (Lausanne) 2021; 8:737813. doi: 10.3389/fmed.2021.737813
4. Delaney TA, Smith NP. Lichen planus mimicking and coexisting with psoriasis in a black patient. Australas J Dermatol 1993; 34(2):59-62. doi: 10.1111/j.1440-0960.1993.tb00859.x
5. Georgescu SR, Tampa M, Mitran MI, Mitran CI, Sarbu MI, Nicolae I, Matei C, Caruntu C, Neagu M, Popa MI. Potential

pathogenic mechanisms involved in the association between lichen planus and hepatitis C virus infection. Exp Ther Med 2018; 17(2):1045-1051. doi: 10.3892/etm.2018.6987

6. Gorouhi F, Davari P, Fazel N. Cutaneous and mucosal lichen planus: a comprehensive review of clinical subtypes, risk factors, diagnosis, and prognosis. ScientificWorldJournal 2014; 2014:742826. doi: 10.1155/2014/742826
7. Gutte RM. Colocalization of linear lichen planus and psoriasis vulgaris. Indian Dermatol Online J 2016; 7(5):438-440. doi: 10.4103/2229-5178.190507
8. Iijima W, Ohtani H, Nakayama T, Sugawara Y, Sato E, Nagura H, Yoshie O, Sasano T. Infiltrating CD8+ T cells in oral lichen planus predominantly express CCR5 and CXCR3 and carry respective chemokine ligands RANTES/CCL5 and IP-10/CXCL10 in their cytolytic granules: a potential self-recruiting mechanism. Am J Pathol 2003; 163(1):261-8. doi: 10.1016/S0002-9440(10)63649-8
9. Ji YZ, Liu SR. Koebner phenomenon leading to the formation of new psoriatic lesions: evidences and mechanisms. Biosci Rep 2019; 39(12):BSR20193266. doi: 10.1042/BSR20193266
10. Karampinis E, Georgopoulou KE, Goudouras G, Lianou V, Kampra E, Roussaki Schulze AV, Zafiriou E. Laser-Induced Koebner-Related Skin Reactions: A Clinical Overview. Medicina (Kaunas) 2024; 60(7):1177. doi: 10.3390/medicina60071177
11. Kiluk P, Flisiak I. The coexistence of oral lichen planus and psoriasis vulgaris – a case report. Dermatol Rev 2016; 2:119–23. doi: 10.5114/dr.2016.59133
12. Koca TT, Sarac G, Baglan T. A brief summary of clinical types of psoriasis. North Clin Istanb 2016; 3(1):79-82. doi: 10.14744/nci.2016.16023
13. Li L, Lu J, Liu J, Wu J, Zhang X, Meng Y, Wu X, Tai Z, Zhu Q, Chen Z. Immune cells in the epithelial immune microenvironment of psoriasis: emerging therapeutic targets. Front Immunol 2024; 14:1340677. doi: 10.3389/fimmu.2023.1340677
14. Man AM, Orăsan MS, Hoteiuc OA, Olănescu-Vaida-Voevod MC, Mocan T. Inflammation and Psoriasis: A Comprehensive Review. Int J Mol Sci 2023; 24(22):16095. doi: 10.3390/ijms242216095
15. Manchanda Y, Rathi SK, Joshi A, Das S. Oral Lichen Planus: An Updated Review of Etiopathogenesis, Clinical Presentation, and Management. Indian Dermatol Online J 2024; 15(1):8-23. doi: 10.4103/idoj.idoj_652_22
16. McCormick TS, Ayala-Fontánez N, Soler DC. Current knowledge on psoriasis and autoimmune diseases. Psoriasis (Auckl) 2016; 6:7-32. doi: 10.2147/PTT.S64950
17. Muneem A, Sakya SM, Asad U. A Case of Lichen Planus Masquerading as Guttate Psoriasis. Cureus 2020; 12(10):e11206. doi: 10.7759/cureus.11206
18. Naldi L, Sena P, Cainelli T. About the association of lichen planus and psoriasis. Dermatologica 1990; 181(1):79-80. doi: 10.1159/000247875
19. Nguyen LTH. Signaling pathways and targets of natural products in psoriasis treatment. Explor Med 2022; 345–367. doi: 10.37349/emed.2022.00098
20. Niebel D, Wilsmann-Theis D, Wenzel J. Successful treatment of psoriatic arthritis and comorbid annular atrophic lichen planus with etanercept. J Dermatol 2020; 47(4):397-401. doi: 10.1111/1346-8138.15222
21. Ohshima N, Shirai A, Asahina A. Coexistence of linear lichen planus and psoriasis in a single patient. J Dermatol 2011; 38(12):1182-4. doi: 10.1111/j.1346-8138.2010.01188.x
22. Ortiz-Lopez LI, Choudhary V, Bollag WB. Updated Perspectives on Keratinocytes and Psoriasis: Keratinocytes are More Than Innocent Bystanders. Psoriasis (Auckl) 2022; 12:73-87. doi: 10.2147/PTT.S327310
23. Rendon A, Schäkel K. Psoriasis Pathogenesis and Treatment. Int J Mol Sci 2019; 20(6):1475. doi: 10.3390/ijms20061475
24. Sandhu S, Sinha P, Shelly D, Bhatt S. A Rare Presentation of Concurrent Onset and Coexistence of Generalized Lichen Planus and Psoriasis in a Child. Indian Dermatol Online J 2020; 11(4):616-618. doi: 10.4103/idoj.IDOJ_459_19
25. Shiohara T, Hayakawa J, Nagashima M. Psoriasis and Lichen planus: Coexistence in a Single Patient: Are Both Diseases Mutually Exclusive? Dermatologica 1989; 179(4):178–182. doi: 10.1159/000248355
26. Song EJ, Shin Wong AJ, Zhang J. Psoriasiform lichen planopilaris: Unusual variant or coincidence. JAAD Case Rep 2021; 11:124-126. doi: 10.1016/j.jdcr.2021.03.037
27. Vajaitu C, Voiculescu VM, Draghici C, Solomon I, Lupu M. Coexistence of Psoriasis, Vitiligo and Oral Lichen Planus – a New Variant of Multiple Autoimmune Syndrome? Maedica (Bucur) 2018; 13(4):336-339. Greek, Modern. doi: 10.26574/maedica.2018.13.4.336
28. Vičić M, Hlača N, Kaštelan M, Brajac I, Sotošek V, Prpić Massari L. Comprehensive Insight into Lichen Planus Immunopathogenesis. Int J Mol Sci 2023; 24(3):3038. doi: 10.3390/ijms24033038
29. Wang Q, Yan D, Zheng S, Li M, Li J, Fu X, Fu D, Hu H, Song X, Tian Z. Cytokine Profiles and the Relationship of Disease Severity in Patients with Psoriasis. Indian J Dermatol 2022; 67(2):204. doi: 10.4103/ijd.ijd_79_22

30. Wechsuruk P, Bunyaratavej S, Kiratiwongwan R, Suphatsathienkul P, Wongdama S, Leeyaphan C. Clinical features and treatment outcomes of nail lichen planus: A retrospective study. JAAD Case Rep 2021; 17:43-48. doi: 10.1016/j.jdcr.2021.09.015
31. Weston G, Payette M. Update on lichen planus and its clinical variants. Int J Womens Dermatol 2015; 1(3):140-149. doi: 10.1016/j.ijwd.2015.04.001
32. Xiao Q, Mears J, Nathan A, Ishigaki K, Baglaenko Y, Lim N, Cooney LA, Harris KM, Anderson MS, Fox DA, Smilek DE, Krueger JG, Raychaudhuri S. Immunosuppression causes dynamic changes in expression QTLs in psoriatic skin. Nat Commun 2023; 14(1):6268. doi: 10.1038/s41467-023-41984-2
33. Yan BX, Chen XY, Ye LR, Chen JQ, Zheng M, Man XY. Cutaneous and Systemic Psoriasis: Classifications and Classification for the Distinction. Front Med (Lausanne) 2021; 8:649408. doi: 10.3389/fmed.2021.649408